PCA7448

PROM Programming Adapter for 4500 Series 4524/4554 Group

User's Manual

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To use the product properly

Precautions for Safety:

- Both in this User's Manual and on the product itself, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.
- The icons' graphic images and meanings are given in "Chapter 1. Precautions for Safety" (page 4). Be sure to read this chapter before using the product.

Chapter 1. Precautions for Safety

In both the user's manual and on the product itself, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties.

This chapter describes the precautions which should be taken in order to use this product safely and properly. Be sure to read this chapter before using this product.

1.1 Safety Symbols and Meanings

⚠ **WARNING**	If the requirements shown in the "WARNING" sentences are ignored, the equipment may cause serious personal injury or death.
⚠ **CAUTION**	If the requirements shown in the "CAUTION" sentences are ignored, the equipment may malfunction.
IMPORTANT	It means important information on using this product.

In addition to the three above, the following are also used as appropriate.

△ means WARNING or CAUTION.

Example: ⚠ **CAUTION AGAINST AN ELECTRIC SHOCK**

⃠ means PROHIBITION.

Example: **DISASSEMBLY PROHIBITED**

● means A FORCIBLE ACTION.

Example: **UNPLUG THE POWER CABLE FROM THE RECEPTACLE.**

The following pages describe the symbols "WARNING", "CAUTION", and "IMPORTANT".

⚠ WARNING

Warnings for Use Environment:

- This equipment is to be used in an environment with a maximum ambient temperature of 35˚C. Care should be taken that this temperature is not exceeded.
- Select the proper programming mode of the PROM programmer.

⚠ CAUTION

Caution to Be Taken for Modifying This Product:

- Do not disassemble or modify this product. Disassembling and modifying the product will void your warranty.

Cautions to Be Taken for This Product:

- Use caution when handling this product. Be careful not to apply a mechanical shock such as falling.
- Do not directly touch the connector pins of this product.
- Be careful with the static electricity when handling this product and the MCU.

Caution for Keeping This Product:

- When not using this product for a long time:
  - (1) Attach the connector pins of this product to the conductive sponge.
  - (2) Put it into a conductive polyvinyl, and keep it in the package case shipped from the factory.
  - (3) Store it in the place where humidity and temperature are low and direct sunshine does not strike.
  - (4) When using this product, check the waste of sponge has not adhered to the connector pins.

IMPORTANT

When Using The Product:

- Attach this product to the IC socket on the PROM programmer properly.
- Insert the MCU to the IC socket of this product properly.
- When inserting and pulling out the MCU, be sure to keep the IC socket side above and horizontal.
- Do not use the PROM programmer's device identification code readout function.

Chapter 2. Introduction

This product is a PROM programming adapter for 4500 Series 4524 and 4554 Group MCUs (4-bit MCU). This product is used to write programs into the internal EPROM of MCU with a commercially available PROM programmer.

This manual mainly explains specifications of this product and how to operate it.

Figure 2.1 shows the external view of the product and its constituent parts.

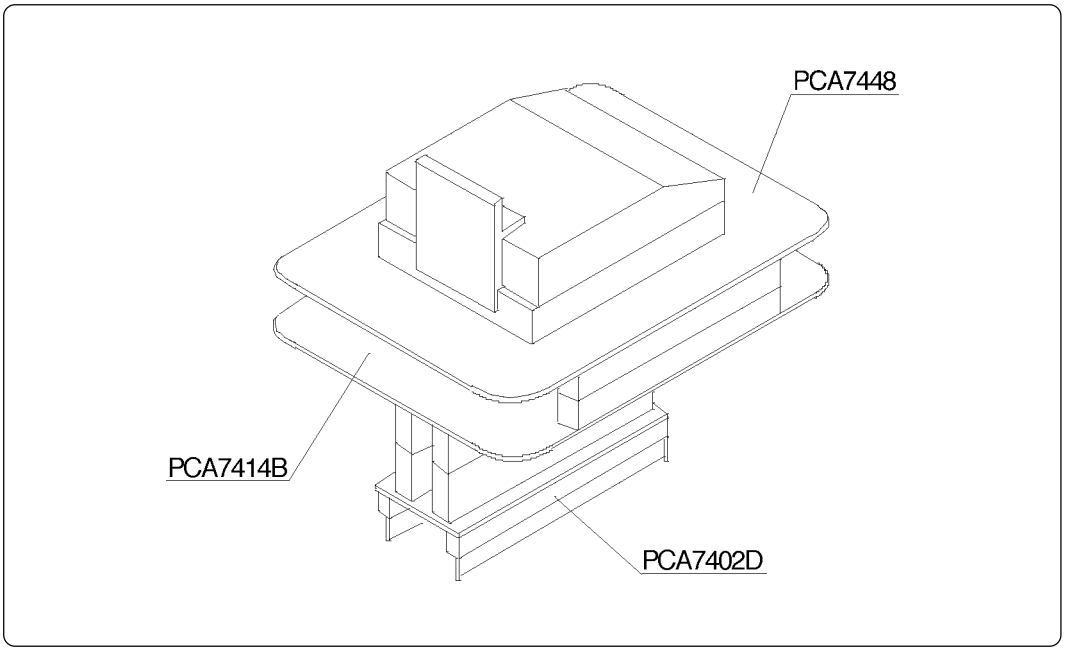

Figure 2.1 External view of the adapter and its constituent parts

2.1 Things to Check When Unpacking

This product consists of the parts listed in Table 2.1. When unpacking, check to see that it contains all of the components.

Table 2.1 Package components

Main unit	PCA7448
Interface unit	PCA7414B*1
Connector	PCA7402D*1 (28-pin)
User's manual	PCA7448 User's Manual (this manual)
	PCA7448 User's Manual (Japanese)

*1 The PCA7414B and the PC7402D are pre-mounted on the PCA7448.

IMPORTANT

Note on This Product Package:

- If any part is missing or there is any doubt about your product package, contact your local distributor.

Chapter 3. Specifications

Table 3.1 lists specifications of the PCA7448.

Table 3.1 Specifications of the PCA7448

Operating clock		Internal on-chip oscillator of the MCU	
Power supply		Supplied from Vcc of the PROM programmer	
Board configuration	PCA7448 (main unit)	Board to insert a programmable MCU (IC socket for MCU mounted on it)	
	PCA7414B*1 (interface unit)	Interface board (Connected by two rows of standard-pitch 18-pin connectors and two rows of standard-pitch 16-pin connectors to the upper and lower boards)	
	PCA7402D*1 (connector)	Board to connect to the PROM programmer (Standard-pitch 28-pin pin-header mounted)	
Applicable MCUs		M34524EDFP	64-pin 0.8-mm-pitch QFP (64P6N-A)
		M34554EDFP	
IC socket		IC51-824.KS-8095 (made by Yamaichi Electronics Co., Ltd.)*2	

*1 The PCA7414B and the PC7402D are pre-mounted on the PCA7448.

*2 For details on the IC socket (IC51-824.KS-8095), contact Yamaichi Electronics Co., Ltd.

Chapter 4. How to Write the Program

This chapter describes procedures you need to follow to write the program.

For details on how to operate the PROM programmer, refer to the user's manual of the PROM programmer.

4.1 Programming Procedure

Follow the steps in Figure 4.1 to write the program.

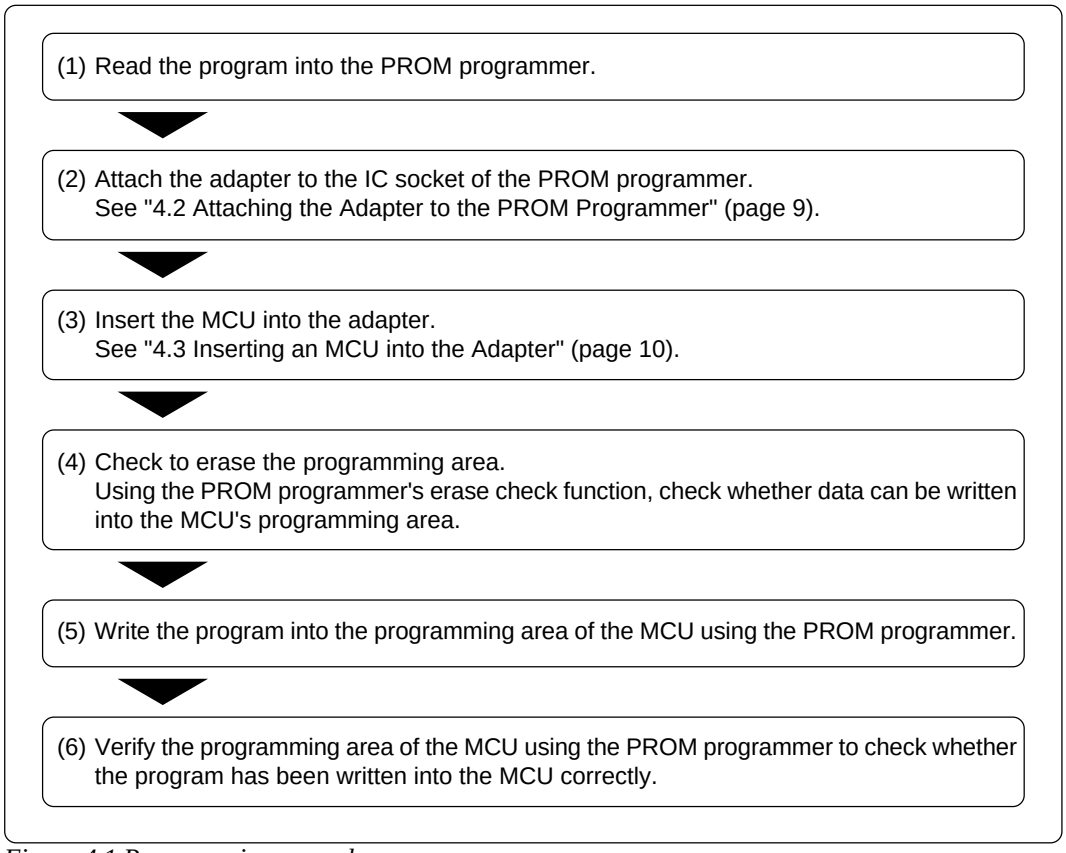

Figure 4.1 Programming procedure

IMPORTANT

Note on Programming by PROM Programmer:

- Some PROM programmers perform the steps (4) to (6) automatically.

4.2 Attaching the Adapter to the PROM Programmer

As shown in Figure 4.2, attach the No. 1 pin of the PCA7402D connector (standard-pitch 28-pin pin-header mounted) to the No. 1 pin of the IC socket of the PROM programmer.

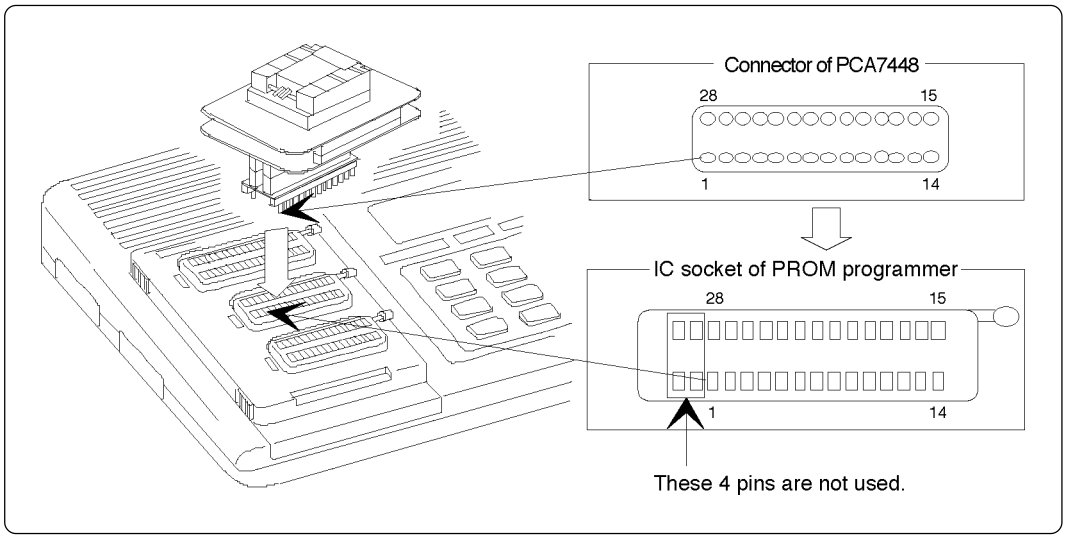

Figure 4.2 Attaching the adapter to the PROM programmer

⚠CAUTION

When Attaching the Adapter to the PROM Programmer:

- Be careful when attaching to the PROM programmer because incorrect insertion can cause fatal damage to the MCU.

4.3 Inserting an MCU into the Adapter

As shown in Figure 4.3, insert the MCU into the IC socket with the No. 1 pin of the MCU matched to the No. 1 pin of the IC socket on the PCA7448.

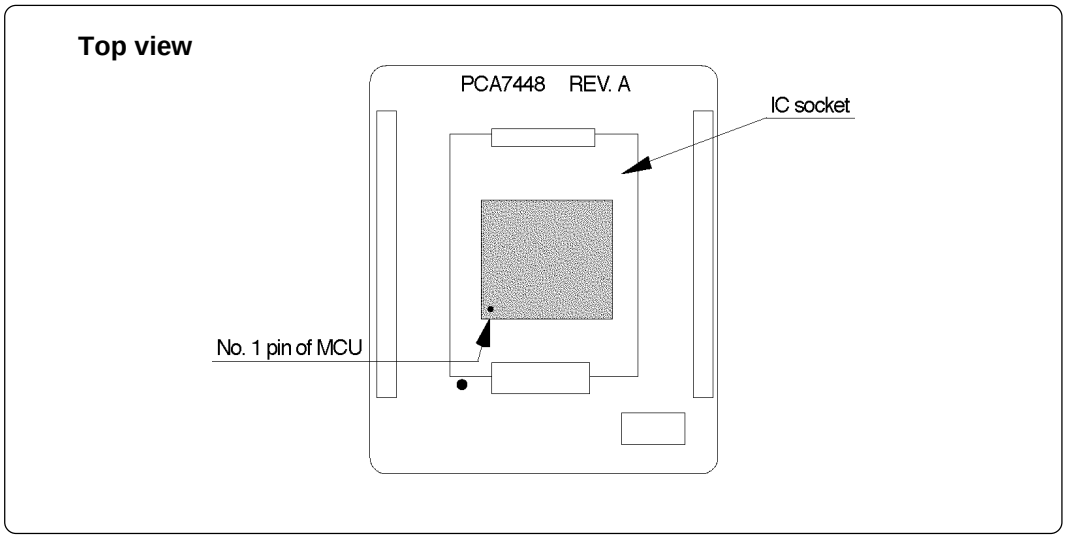

Figure 4.3 Inserting an MCU

4.4 Precautions When Inserting an MCU into the Adapter

When opening and closing the IC socket, keep the IC socket side above and horizontal. Figure 4.4 shows the state of opening and closing the IC socket to insert an MCU.

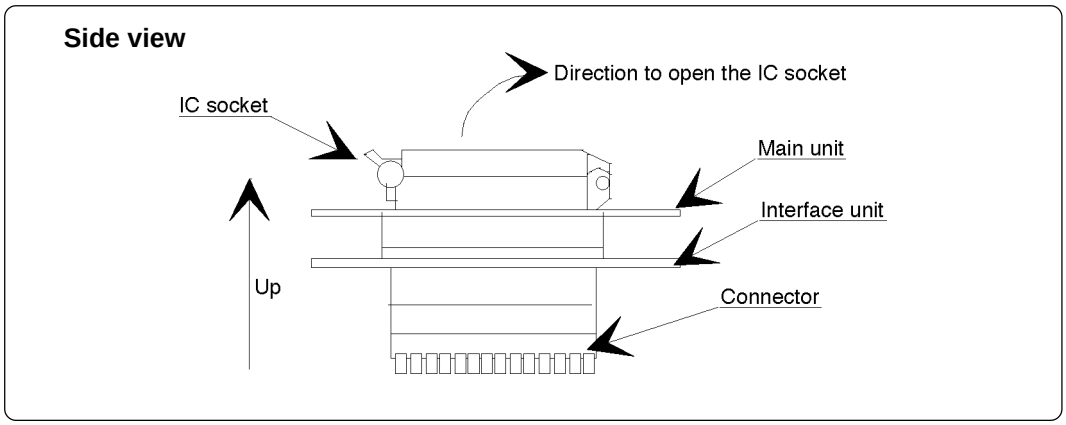

Figure 4.4 Opening and closing the IC socket

⚠ CAUTION

When Inserting an MCU into the Adapter:

- Be careful when attaching to the PROM programmer because incorrect insertion can cause fatal damage to the MCU.
- When opening and closing the IC socket, keep the IC socket side above and horizontal. Otherwise the inside of the IC socket may become damaged and cause an electrical insulation failure.

4.5 Caution to Be Taken for Handling This Product

When not using this product, attach the connector pins of this product to the conductive sponge as it was shipped from the factory.

And keep it in the place where temperature and humidity are low and direct rays do not hit.

⚠ CAUTION

When Handling This Product:

- Do not touch the connector in the IC socket and the pins on the PROM programmer connector because dirt may cause an electrical insulation failure.

Chapter 5. Recommended PROM Programmers

The PROM programmers listed in Table 5.1 are recommended for this product. Using the actual products, we have verified that these PROM programmers can be used to write programs without problem.

Table 5.1 Recommended PROM programmers

Manufacturer	Type name	Device	Programming voltage (Vpp)
Advantest Corporation	R4944A	M5M27C256 mode	12.5 V
	R4945		
	R4945A		

IMPORTANT

Notes on PROM Programmers:

- Nonconformity occurring by using any other PROM programmers listed in Table 5.1 can not be supported.
- For how to operate the PROM programmer and the latest type of PROM programmers, contact the manufacturer to confirm whether it can be used for your product.

Chapter 6. Memory Maps

Figure 6.1 shows memory maps of the MCU and the PROM programmer.

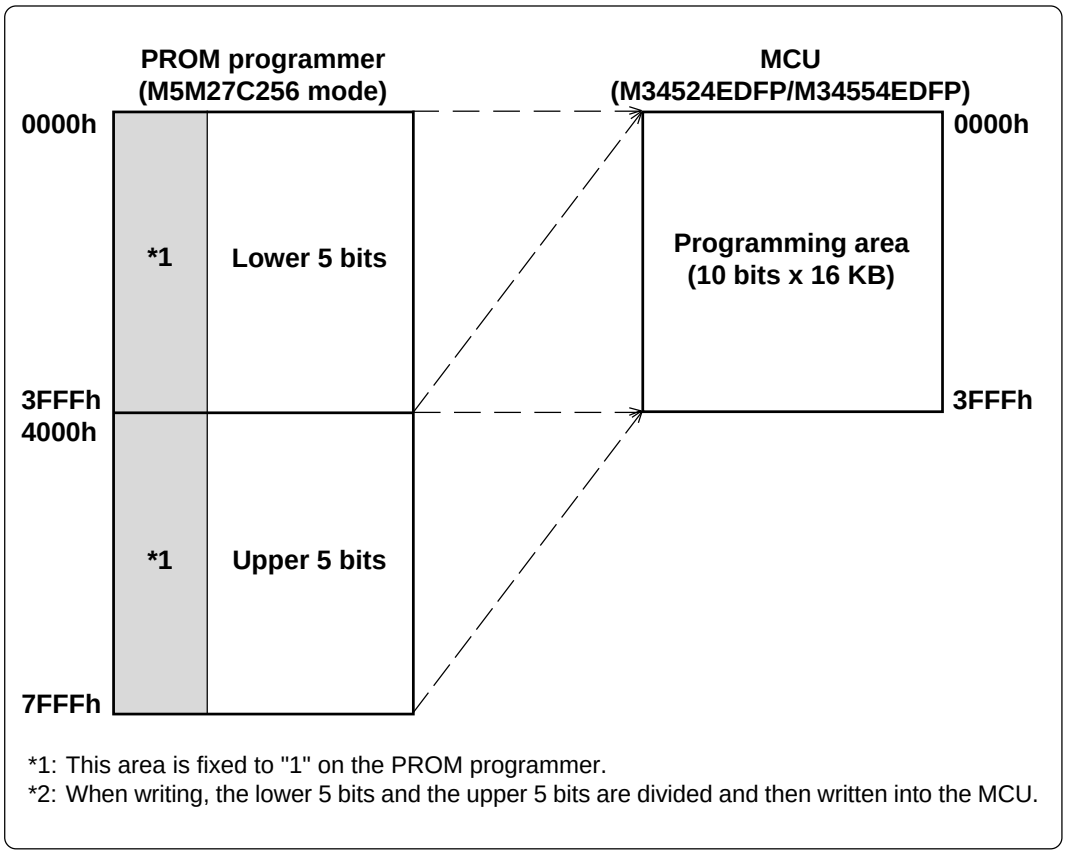

Figure 6.1 Memory maps (M5M27C256 mode)

Chapter 7. Troubleshooting

The table below summarizes errors to be checked carefully before you determine them to be a fault.

7.1 Errors That Occur When Writing to PROM

Table 7.1 Errors and checkpoints (when newly purchased)

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	9
	Is the MCU attached to the correct position?	10
PROM programmer	Is the correct device selected?	12
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-

Table 7.2 Errors and checkpoints (previously written normally)

Cause	Remedy	See page
Programming adapter	Is the adapter attached to the correct position of the PROM programmer?	9
	Is the MCU attached to the correct position?	10
PROM programmer	Is the correct device selected?	12
Contact failure	The IC socket of the PROM programmer may be stained. The socket needs replacing.	-
	The PROM programmer connector (28-pin pin-header) at which the PROM programmer is contacted may be stained. Clean it with alcohol, etc.	-

7.2 MCUs Do Not Function Normally

The program operates normally on the emulator, but when the MCU that has normally been written is attached the same program does not necessarily operate in the same manner. The differences between actual MCUs and the emulator are listed below.

(1) About ROM area

With the emulator, the area where the program has not been read serves as NOP instruction (00h), but the MCU which has been written by the PROM programmer serves as FFh. Therefore the program happens to appear functioning normally even though it may have gone wild.

(2) About the initial value of the register

With the emulator, the initial value of the register is set to register Z to display the contents of RAM according to the area for referencing. However, with the actual MCU, the register Z is indefinite after resetting. For this, if the register Z is not set, the contents of RAM may not be read out properly.

(3) About oscillations

The emulator is operated by the external clock on the MCU board, while the actual MCU is operated by the oscillator on the target system. For this, when the oscillator circuit on the target system does not oscillate properly, the MCU does not function normally.

(4) About differences of the characteristics

The emulator and the actual MCU may differ in characteristics. Consult the user's manuals of the MCU and the MCU board to check for differences in the characteristics again.

7.3 Other Precautions

(1) About the Recommended PROM Programmers

As MCUs are not totally equal to EPROM, there are some PROM programmer that can not be used depending on MCU type. The recommended PROM programmers we have verified are listed in this user's manual. We have verified that those PROM programmers can be used to write programs without problem.

The other PROM programmers which can set programming area might be used as long as they pass the verification check, however, we do not assure that they work properly.

Note:
No matter which type of PROM programmer you use, it is necessary to verify completion of programming by executing screening, etc. that are stipulated for each MCU used.

(2) About Reading Out of Device Identification Code

Please do not use the PROM programmer's device identification code*[1] readout function.

Using this function may break down the MCU. The device identification code is included in EPROM to indicate the manufacturer code and device code.

*[1] Depending on PROM programmer manufacturers, this may be referred to by another name (e.g. ID code).

7.4 How to Request for Support

After checking this manual, fill in the following information and email to your local distributor.

For prompt response, please specify the following information:

(1) Contact address

- Company name
- Department
- Responsible person
- Phone number
- Fax number
- E-mail address

(2) Product information

- Name of the programming adapter
- Serial number
- Date of purchase
- Target MCU
- Symptoms (Fails blank check/Cannot write a program/Fails verification etc.)
- Detailed symptoms
- How often does the problem occur? (2 out of 10 etc.)
- When did the problem start to occur? (Since purchase/Used to work correctly)
- Type name of the PROM programmer (Advantest R4945A etc.)
- Specified device when writing to PROM (M27C101 etc.)
- Specified programming area when writing to PROM
- Switch settings of the adapter when writing to PROM

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